

**Statement of Basis**  
**Alabama River Cellulose, Inc.**  
**106-0010**

Georgia-Pacific – Alabama River Cellulose (ARC) has applied for a third renewal of its Major Source Operating Permit 106-0010. This proposed Title V Major Source Operating Permit is issued under the provisions of ADEM Admin. Code R. 335-3-16. The above-named applicant has requested authorization to perform the work or operate the facility shown on the application and drawings, plans and other documents attached hereto or on file with the Air Division of the Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit. The current permit was issued on September 9, 2015, with an effective date of January 1, 2016, and has an expiration date of December 31, 2020. The application for the third renewal was received on June 26, 2020.

**I. BACKGROUND:**

ARC owns and operates a Kraft pulp and paper mill located in Perdue Hill, Alabama. The site is located in Monroe County, which is classified as a Class II county for particulates. Additionally, Monroe County is currently listed in attainment with all National Ambient Air Quality Standards (NAAQS). There are no ongoing enforcement actions against ARC necessitating additional requirements to achieve compliance with permit conditions. ARC is divided into two pulping lines including the following areas and subareas: No. 7 Mill (formerly No. 1) – wood-yard, Kraft fiber-line, pulp dryer, liquor recovery, recausticizing, and utilities, and No. 8 Mill (formerly No. 2) – wood-yard, Kraft fiber-line, pulp dryer, liquor recovery, tall oil, recausticizing, and utilities. The No. 7 Mill produces both hardwood and softwood Kraft pulp for sale as market pulp. The No. 8 Mill produces bleached softwood Kraft pulp for sale as market (baled) pulp and rolled fluff pulp. The facility is a major source with respect to Title V, NSPS, PSD, and the MACT/NESHAP standards. ARC is a major source for the following pollutants: PM, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, VOCs, lead, TRS, total HAP's, acetaldehyde, ammonia, benzene, chlorine, chloroform, formaldehyde, HCl, hydrogen sulfide, sulfuric acid, and methanol.

**II. NO. 7 MILL WOODYARD AND KRAFT FIBER LINE:**

The pulp mill converts wood chips from the wood-yard into papermaking fiber via the Kraft pulping process. This area includes a continuous pulping process. The pulp mill operation at the Mill is comprised of several areas. White liquor for the pulping process is received from the recausticizing area, and steam is received from the utility area. Spent cooking or black liquor from the pulping operations is removed via a washing process and sent to the recovery and recausticizing area for recycling. The Kraft fiber-line consists of the continuous digester system, pulp washing system, and bleach Plant. Each of the pulping systems is described in greater detail in the following sections:

**A. No. 7 Continuous Digester:**

Wood chips are cooked in two vertical, single vessel down-flow continuous digesters. The chips are combined with a hot solution containing sodium hydroxide and sodium sulfide called white liquor. When finished cooking, the chips/liquor mixture is released at the bottom of the digester from the pressurized vessel through a blow valve. The pulp is transferred to the blow tank, and from the blow tank, the pulp and spent cooking chemicals (called black liquor) are pumped through a centrifugal cyclone, then through a deknottedter. After the deknottedter, the pulp and liquor mixture passes over a series of four rotary vacuum washers.

The pulp mill currently has an Esco continuous digester system, which can process both softwood and hardwood pulp. The Esco was originally installed in 1978. It has the capacity to produce 137,993 lbs/hr of air dry unbleached Kraft pulp.

**1. Control Equipment:**

Emissions from the No. 7 Continuous Digester are collected in the blow tanks and vented to the non-condensable gas (NCG) collection system. The digester's low volume high concentration gases (LVHC) are required to be collected and treated per 40 CFR Part 63 Subpart S. The Mill has elected to treat the LVHC gases by incineration; thus, the LVHC exhaust gases are sent to the No. 7 Lime Kiln or the Backup NCG Incinerator for incineration.

a. Emission Limits and Proposed Periodic Monitoring:

The No. 7 Continuous Digester system is subject to 40 CFR Part 63 Subpart S (MACT I) and subject to 40 CFR Part 60 Subpart BB (NSPS). For this source, all gases that contain total reduced sulfur are required to be incinerated in the No. 7 Lime Kiln or the Backup NCG Incinerator per Part 60 Subpart BB. All LVHC gases are to be collected and incinerated as required by Subpart S. Also, per Subpart S requirements, the digester's process condensates are pumped to an activated sludge treatment system. Subpart S also requires annual testing and monthly inspections of the LVHC NCG system.

**B. No. 7 Pulp Washing and Screening System:**

The function of the pulp washing system is to wash out the residual cooking liquor from the pulp. The pulp washing system is the area in the pulp mill in which wood chips are converted into unbleached pulp, this includes deknottling, pulp washing, screening, decker dewatering, and storage. From the digester blow tank, the pulp enters the wash system. The Mill operates an Eimco custom washing system originally installed in 1978. This unit has the capacity to produce 137,993 lbs/hr of air dry unbleached Kraft pulp.

1. Control Equipment:

Emissions from the No. 7 Pulp Washing System are collected and vented to the (NCG) collection system. The pulp washing system forms high volume low concentration (HVLC) gases, which are also required to be collected and treated per 40 CFR Part 63 Subpart S. The Mill has elected to treat the HVLC gases by incineration; thus, the HVLC exhaust gases are sent to the No. 7 Recovery Furnace.

a. Emission Limits and Proposed Periodic Monitoring:

The No. 7 Pulp Washing System is subject to 40 CFR Part 63 Subpart S (MACT I) and is subject to 40 CFR Part 60 Subpart BB. For this source, all gases that contain total reduced sulfur are required to be incinerated in the No. 7 Recovery Furnace per Subpart BB. All HVLC gases discharged from the pulp washing system are required to be incinerated in the No. 7 Recovery Furnace as required by Subpart S. Subpart S also requires annual testing and monthly inspections of the HVLC NCG system.

**C. No. 7 Bleach Plant**

Brown hardwood and softwood stock is diluted in the bottom of the high density storage chest and pumped into the bleach plant. The bleaching sequence is carried out continuously in five stages using different chemicals, temperatures, and retention times at each stage. The sequence is 1) chlorine dioxide, 2) caustic extraction with oxygen and hydrogen peroxide, 3) chlorine dioxide, 4) caustic extraction, and 5) chlorine dioxide.

The Mill operates a Parsons and Whittemore bleaching system originally installed in 1978 and later modified in 2005. This unit has the capacity to produce 137,993 lbs/hr.

1. Control Equipment:

The bleach plant is equipped with a dual laminate packed bed wet scrubbing system to remove residual Cl and ClO<sub>2</sub> fumes from vent exhausts. A weak caustic is used as the scrubbing medium in the packed tower. Vent gases from the towers, washers, and seal tanks in the No. 7 Bleach Plant where chlorinated bleaching chemical is applied are conveyed to a packed-bed scrubber for treatment. The scrubber shares a combined stack with the No. 8 Bleach Plant scrubber.

a. Emission Limits and Proposed Periodic Monitoring

The equipment at each bleaching stage of the bleaching system where chlorinated compounds are introduced is required to be enclosed and vented into a closed-vent system and routed to a control device that meets the requirements as specified in 40 CFR Part 63 Subpart S. To reduce chloroform emissions, ARC has elected to comply with the guidelines as specified in §63.445(d)(1) by not using hypochlorite or chlorine for bleaching in the bleaching system. The No. 7 Bleach Plant's Cl emissions are limited by 40 CFR Part 63 Subpart S, and the ClO<sub>2</sub> emissions have a limit directed by the Air Toxics Policy. The bleach plant's ClO<sub>2</sub> and Cl emission limits are 2.87 lb/hr and 10 ppmv, respectfully. A continuous monitoring system (CMS, as defined in 40 CFR 63 Subpart A General Provisions § 63.2) shall be installed, calibrated, certified, operated, and maintained according to the manufacturer's specifications. The CMS shall include a continuous recorder. The CMS shall be operated to measure the following parameters for each gas scrubber used to comply with the bleaching system requirements of 40 CFR 63 Subpart S § 63.445(c).

- (a) The pH or the oxidation/reduction potential of the gas scrubber effluent;
- (b) The gas scrubber liquid influent flow rate; and
- (c) The bleach plant scrubber ID fan continuous operating status (on/off).

The Mill is required to perform a Cl and ClO<sub>2</sub> emission test and submit a report at least once per 5 year permitting period.

### **III. NO. 8 MILL WOODYARD AND KRAFT FIBER LINE:**

The pulp mill converts wood chips from the wood-yard into papermaking fiber via the Kraft pulping process. This area includes a continuous pulping process. The pulp mill operation at the Mill is comprised of several areas. White liquor for the pulping process is received from the recausticizing area, and steam is received from the utility area. Spent cooking or black liquor from the pulping operations is removed via a washing process and sent to the recovery and recausticizing area for recycling. The Kraft fiber-line consists of the continuous digester system, pulp washing system, and bleach plant. Each of the pulping systems is described in greater detail in the following sections:

#### **A. No. 8 Continuous Digester:**

Wood chips are cooked in a two-vessel continuous down-flow digester. The chips are combined with a hot solution containing sodium hydroxide and sodium sulfide called white liquor. When the chips/liquor mixture has finished cooking, it is released at the bottom of the digester from the pressurized vessel through a blow valve. The pulp is transferred to the blow tank, and from the blow tank, the pulp and spent cooking chemicals called black liquor are pumped through a centrifugal cyclone, then through a deknottedter. After the deknottedter, the pulp and liquor mixture pass over a series of four rotary vacuum washers.

The pulp mill currently has a Kamyr continuous digester system, which can process both softwood and hardwood pulp. The Kamyr was originally installed in 1991 and later modified in 2003-2004. It has the capacity to produce 165,000 lbs/hr of air dry unbleached kraft pulp.

#### **1. Control Equipment:**

Emissions from the No. 8 Continuous Digester are collected in the blow tanks and vented to the NCG collection system. The digester's LVHC gases are required to be collected and treated per 40 CFR Part 63 Subpart S. The Mill has elected to treat the LVHC gases by incineration; thus, the LVHC exhaust gases are sent to the No. 8 Lime Kiln or the Backup NCG Incinerator for incineration.

#### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 8 Continuous Digester system is subject to 40 CFR Part 63 Subpart S (MACT I) and subject to 40 CFR Part 60 Subpart BB (NSPS). For this source, all gases that contain total reduced sulfur (TRS) are required to be incinerated in the No. 8 Lime Kiln or the Backup NCG Incinerator per Subpart BB. All LVHC gases are to be collected and incinerated as required by Subpart S. Also, per Subpart S requirements, the digester's process condensates are pumped to an activated sludge treatment system. Subpart S also requires annual testing and monthly inspections of the LVHC NCG system.

## **B. Pulp Washing and Screening System:**

The function of the pulp washing system is to wash out the residual cooking liquor from the pulp. The pulp washing system is the area in the pulp mill in which wood chips are converted into unbleached pulp, this includes deknottling, pulp washing, screening, decker dewatering, and storage. From the digester blow tank, the pulp enters the wash system. The Mill operates a Kamyr washing system originally installed in 1991 and later modified in 2004. The washing system has the capacity to process 165,000 lbs/hr of air dry unbleached Kraft pulp.

### **1. Control Equipment:**

Emissions from the pulp washing system are collected and vented to the non-condensable gas (NCG) collection system. The pulp washing system forms high volume low concentration (HVLC) gases, which are also required to be collected and treated per 40 CFR Part 63 Subpart S. The Mill has elected to treat the HVLC gases by incineration; thus, the HVLC exhaust gases are sent to the No. 8 Recovery Furnace for incineration.

#### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 8 Pulp Washing System is subject to 40 CFR Part 63 Subpart S (MACT I) and is subject to 40 CFR Part 60 Subpart BB. For this source, all gases that contain total reduced sulfur are required to be incinerated in the No. 8 Recovery Furnace. All HVLC gases discharged from the pulp washing system are required to be incinerated in the No. 8 Recovery Furnace as required by Subpart S. Subpart S also requires annual testing and monthly inspections of the HVLC NCG system

## **C. No. 8 Bleach Plant**

Brown hardwood and softwood stock is diluted in the bottom of the high density storage chest and pumped into the bleach plant. The bleaching sequence is carried out continuously in five stages using different chemicals, temperatures, and retention times at each stage. The sequence is 1) chlorine dioxide, 2) caustic extraction with oxygen and hydrogen peroxide, 3) chlorine dioxide, 4) caustic extraction, and 5) chlorine dioxide.

The Mill operates a Kamyr bleaching system originally installed in 1991 and later modified in 2005. This unit has the capacity to produce 165,000 lbs/hr.

### **1. Control Equipment:**

The bleach plant is equipped with a dual laminate packed bed wet scrubbing system to remove residual Cl and ClO<sub>2</sub> fumes from vent exhausts. A weak caustic is used as the scrubbing medium in the packed tower. Vent gases from the towers, washers, and seal tanks in the No. 8 Bleach Plant where chlorinated bleaching chemical is applied are conveyed to a packed-bed scrubber for treatment. The scrubber shares a combined stack with the No. 7 Bleach Plant scrubber.

#### **a. Emission Limits and Proposed Periodic Monitoring**

The equipment at each bleaching stage of the bleaching system where chlorinated compounds are introduced is required to be enclosed and vented into a closed-vent system and routed to a control device that meets the requirements as specified in 40 CFR Part 63 Subpart S. To reduce chloroform emissions, ARC has elected to comply with the guidelines as specified in §63.445(d)(1) by not using hypochlorite or chlorine for bleaching in the bleaching system. The No. 8 Bleach Plant's Cl emission limit is subject to 40 CFR Part 63 Subpart S, and the ClO<sub>2</sub> emission limit is subject to State Air Toxics Program. The bleach plant's ClO<sub>2</sub> and Cl emission limits are 3.33 lb/hr and 10 ppmv, respectfully. A continuous monitoring system (CMS, as defined in 40 CFR 63 Subpart A General Provisions § 63.2) shall be installed, calibrated, certified, operated, and maintained according to the manufacturer's specifications. The CMS shall include a continuous recorder. The CMS shall be operated to measure the following parameters for each gas scrubber used to comply with the bleaching system requirements of 40 CFR 63 Subpart S § 63.445(c).

- (d) The pH or the oxidation/reduction potential of the gas scrubber effluent;

- (e) The gas scrubber liquid influent flow rate; and
- (f) The bleach plant scrubber ID fan continuous operating status (on/off).

The Mill is required to perform a Cl and ClO<sub>2</sub> emission test and submit a report at least once per 5 year permitting period.

#### **IV. NO. 7 MILL LIQUOR RECOVERY SYSTEMS:**

Weak black liquor is collected from the brown stock washers in the pulp mill and passed through a set of evaporators and concentrators to raise the solids content of the black liquor. The vapors from the feed stages of the evaporator/concentrator area are sent to the NCG collection system. The concentrated black liquor is then fired in a recovery furnace. The resulting inorganic smelt is then dissolved and sent to the recausticizing area for further processing. The No. 7 Mill's recovery system consists of the No. 7 Multiple-Effect Evaporator and pre-evaporator system, No. 7 Recovery Furnace, and No. 7 Smelt Dissolving Tank.

##### **A. No. 7 Multiple-Effect Evaporator System:**

Black liquor contains the residual pulping chemicals and dissolved organic substances from wood chips. Under normal operating conditions, the brown stock washer filtrate will have a solids content of 18%. To raise the solids content, the liquor is routed to a Goslin/Lundberg/HPD multiple-effect evaporator system, which has the capacity to produce 229,667 lb/hr of virgin dry black liquor solids. The concentrated black liquor (65% solids) is sent to the recovery furnace. The No. 7 Evaporator System was originally installed in 1978 and later modified in 2004-2005.

##### **1. Control Equipment:**

Emissions from the No. 7 Multi-Effect Evaporator System are collected and then vented to the NCG collection system. The exhaust gases from the evaporator form LVHC gases, which are also required to be collected and treated per 40 CFR Part 63 Subpart S. The Mill has elected to treat the LVHC gases by incineration; thus, the LVHC exhaust gases are sent to the No. 7 Lime Kiln or Backup NCG Incinerator for incineration.

##### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 7 Multi-Effect Evaporator System is subject to 40 CFR Part 63 Subpart S (MACT I) and subject to 40 CFR Part 60 Subpart BB (NSPS). For this source, all gases that contain total reduced sulfur are required to be incinerated in the No. 7 Lime Kiln or Backup NCG Incinerator. All LVHC gases are to be collected and incinerated as required by Subpart S. Also, per Subpart S requirements, the hot-well and the 5<sup>th</sup> and 6<sup>th</sup> effect foul condensates are pumped to an activated sludge treatment system. Subpart S also requires annual testing and monthly inspections of the LVHC NCG system.

##### **B. No. 7 Recovery Furnace:**

The No. 7 Recovery Furnace burns the organic compounds contained in black liquor to generate steam and recover the sodium and sulfur compounds used in the Kraft cooking process. The recovery furnace and its operation can be broken down into several sections: furnace area, convective heat transfer area, combustion air control, black liquor handling, smelt removal and dilution, and air emissions control. The hot gases from the combustion zone pass through the steam generation zone, which includes super-heater, boilers, and economizer. The No. 7 Recovery Furnace produces steam by firing up to 229,667 pounds of black liquor solids per hour. The No. 7 Recovery Furnace is permitted to fire natural gas, tall oil, glycerin, biodiesel, No. 2 - 5 Fuel Oil, and black liquor solids. The Babcock and Wilcox recovery furnace was originally manufactured in 1978 at another mill site, and in 2003-2004 installed at ARC. Updates associated with the 40 CFR Part 63 Subpart MM amendments, published on October 11, 2017 by EPA, will be included as part of this renewal. Additionally, a number of administrative changes were made including specifying 3-hour averages as 3-hour block averages.

##### **1. Control Equipment:**

Emissions from the No. 7 Recovery Furnace are controlled by two electrostatic precipitators in parallel. The recovery furnace acts as a control device for the incineration of HVLC NCG gases.

a. Emission Limits and Proposed Periodic Monitoring:

The No. 7 Recovery Furnace is subject to the following requirements

- ADEM Admin. Code 335-3-14-.04 (9) Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) limits for particulate matter, total reduced sulfur, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds and sulfuric acid mists;
- Rule 335-3-10-.02 (1) and (28) New Source Performance Standards 40 CFR 60 - Subpart BB for Kraft pulp mills when black liquor solids are fired;
- Rule 335-3-10-.02(2)(b) New Source Performance Standards Subpart Db for nitrogen oxide emissions and 40 CFR 60 Subpart A, General Provisions when fossil fuel oil or natural gas are fired; and
- National Emission Standards for Hazardous Pollutants General Provisions as provided for in Table 1 of Subpart MM and 40 CFR Part 63 Subpart MM.

The No. 7 Recovery Furnace has the following limits and monitoring requirements:

PM	$\leq 0.025$ gr/dscf @ 8% O <sub>2</sub> and $\leq 74$ lbs/hr
TRS	$\leq 5$ ppmv @ 8% O <sub>2</sub> and $\leq 9.1$ lbs/hr
NO <sub>x</sub>	$\leq 90$ ppmv @ 8% O <sub>2</sub> and $\leq 223$ lbs/hr Pursuant to Section 60.44b(c), Code of Federal Regulations, the fossil fuel annual capacity factor $\leq 10\%$ , where the annual capacity factor is defined as the ratio between the actual heat input to the boiler from fossil fuel during a calendar year and the potential heat input to the boiler had it been operated 8,760 hours at the maximum designed heat input
Opacity	$\leq 35\%$
SO <sub>2</sub> (BLS fired)	$\leq 100$ ppmv @ 8% O <sub>2</sub> and $\leq 345$ lbs/hr
SO <sub>2</sub> (fuel oil fired)	$\leq 0.3$ lbs/MMBtu fuel oil heat and $\leq 345$ lbs/hr
CO	$\leq 300$ ppmv @ 8% O <sub>2</sub> and $\leq 453$ lbs/hr
VOC	$\leq 0.048$ lbs/MMBtu and $\leq 130$ lbs/hr
SAM	$\leq 5$ ppmv @ 8% O <sub>2</sub> and $\leq 27$ lbs/hr
HAPs	PM as a surrogate $\leq 0.044$ gr/dscf @ 8 % O <sub>2</sub>

- Yearly emissions tests will be required for particulate matter;
- For particulate matter and opacity periodic monitoring, if the average of any ten consecutive six minute opacity averages exceeds 20% the cause is to be investigated and appropriate corrective action is to be taken;
- A continuous TRS monitor (CEMs) and continuous opacity monitor (COMs) shall be installed, maintained, and operated;
- Records of all three hour block average black liquor firing rates for this unit shall be maintained for PM, TRS, SO<sub>2</sub>, NO<sub>x</sub>, VOC, CO, and SAM periodic monitoring;
- Since this source is subject to MACT II, it is required to submit semi-annual excess emission reports and must comply with the monitoring, testing, and reporting requirements of Subpart MM;
- ARC is required to submit quarterly excess TRS and Opacity emission reports;
- ARC shall perform and submit an emission test for SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, and SAM once every five years; and

- Records of the amount of fuel oil and natural gas fired shall be made and the annual capacity factor calculated for each calendar year and maintained on file available for review for at least five years.

### **C. No. 7 Smelt Dissolving Tank:**

The No. 7 Smelt Dissolving Tank uses weak wash to dissolve the inorganic residue from the combustion of black liquor solids in the No. 7 Recovery Furnace. The dissolved smelt which contains a mixture of sodium sulfide and sodium carbonate called “green liquor”, is then sent to the Mill’s causticizing area for further processing. A Babcock & Wilcox smelt dissolving tank was originally installed in 1978 and later modified in 2004-2005. The original tank was replaced in 2014 with the issuance of Air Permit X002. During the third renewal references to NSPS Subpart BB were corrected to reference Subpart BBa. Additionally, testing and reporting requirements for BBa were included. A number of administrative changes were made including specifying 3-hour averages as 3-hour block averages. Lastly, updates associated with the 40 CFR Part 63 Subpart MM amendments, published on October 11, 2017 by EPA, will be incorporated at this time.

#### **1. Control Equipment:**

The vent stack of the No. 7 Smelt Dissolving Tank is fitted with a venturi wet scrubber. The wet scrubber is used control the entrained particulate matter and TRS.

#### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 7 Smelt Dissolving Tank is subject to:

- 40 CFR 60 Subpart A and Subpart BBa;
- ADEM Admin. Code 335-3-14-.04 (9) Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) limits for particulate matter, total reduced sulfur, and sulfur dioxide;
- ADEM Admin. Code 335-3-4-.01 for opacity; and
- 40 CFR Part 63 Subpart MM.

The No. 7 Smelt Dissolving Tank has the following limits and monitoring requirements:

PM	$\leq 0.12$ lbs/ton of BLS (dry weight) and $\leq 13.0$ lbs/hr
TRS	$\leq 0.033$ lb/ton of BLS and $\leq 3.6$ lbs/hr
SO <sub>2</sub>	$\leq 0.05$ lb/ton of BLS (as a 3-hour block average) and $\leq 5.4$ lbs/hr
Opacity	$\leq 20$ % with one 6-minute period up to 40 % in any one hour period
HAPs	PM as a surrogate for HAPs $\leq 0.2$ lbs/ton of BLS

- Yearly particulate matter emissions tests are required to be performed and submitted;
- Since this source is subject to MACT II, it is required to submit semi-annual excess emission reports and must comply with the monitoring, testing, and reporting requirements of Subpart MM;
- Since this source is subject to NSPS, it is required to submit semi-annual excess emission reports and must comply with the monitoring, testing, and reporting requirements of Subpart BBa;
- For PM, TRS, and SO<sub>2</sub> periodic monitoring, ARC shall monitor and maintain records of all the three-hour block average liquor firing rate;
- For TRS, and SO<sub>2</sub> periodic monitoring, ARC shall monitor and maintain records of all the three-hour block average scrubber recirculation flow or scrubber differential pressure;
- ARC shall perform and submit a TRS and SO<sub>2</sub> emission test once every five years, and
- Pursuant to 40 CFR Part 63, Subpart MM, ARC shall monitor the wet scrubber liquid recirculation flow rate and the scrubber differential pressure.

### **V. NO. 8 MILL LIQUOR RECOVERY SYSTEMS:**

Weak black liquor is collected from the brown stock washers in the pulp mill and passed through a set of evaporators and concentrators to raise the solids content of the black liquor. The vapors from the feed stages

of the evaporator/concentrator area are sent to the NCG collection system. The concentrated black liquor is then fired in a recovery furnace. The resulting inorganic smelt is then dissolved and sent to the recausticizing area for further processing. The No. 8 Mill's recovery system consists of the No. 8 Evaporator/Concentrator set, No. 8 Recovery Furnace, and No. 8 Smelt Dissolving Tank.

#### **A. No. 8 Multiple-Effect Evaporator System:**

Black liquor contains the residual pulping chemicals and dissolved organic substances from wood chips. Under normal operating conditions, the brown stock washer filtrate will have a solids content of 15%. To raise the solids content, the liquor is routed to a Goslin – Birmingham/Tampella multiple-effect evaporator system, which has the capacity to produce 282,667 lb/hr of virgin dry black liquor solids. The concentrated black liquor (67% solids) is sent to the recovery furnace. The No. 8 Evaporator System was originally installed in 1991.

##### **1. Control Equipment:**

Emissions from the No. 8 Multi-Effect Evaporator System are collected and vented to the NCG collection system. The exhaust gases from the evaporator form LVHC gases, which are also required to be collected and treated per 40 CFR Part 63 Subpart S. The Mill has elected to treat the LVHC gases by incineration; thus, the LVHC exhaust gases are sent to the No. 8 Lime Kiln or Backup NCG Incinerator for incineration.

##### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 8 Multi-Effect Evaporator System is subject to 40 CFR Part 63 Subpart S (MACT I) and subject to 40 CFR Part 60 Subpart BB (NSPS). For this source, all gases that contain TRS are required to be incinerated in the No. 8 Lime Kiln or Backup NCG Incinerator per Subpart BB. All LVHC gases are to be collected and incinerated as required by Subpart S. Also, per Subpart S requirements, evaporator foul condensates are pumped to an activated sludge treatment system. Subpart S also requires annual testing and monthly inspections of the LVHC NCG system.

#### **B. No. 8 Recovery Furnace:**

The No. 8 Recovery Furnace burns the organic compounds contained in black liquor to generate steam and recover the sodium and sulfur compounds used in the Kraft cooking process. The recovery furnace and its operation can be broken down into several sections: furnace area, convective heat transfer area, combustion air control, black liquor handling, smelt removal and dilution, and air emissions control. The hot gases from the combustion zone pass through the steam generation zone, which includes super-heater, boilers, and economizer. The No. 8 Recovery Furnace produces steam by firing up to 279,167 pounds of black liquor solids per hour. The No. 8 Recovery Furnace is permitted to fire natural gas, No. 2 - 5 Fuel Oil, and black liquor solids. The Babcock and Wilcox recovery furnace was originally installed in 1991. Updates associated with the 40 CFR Part 63 Subpart MM amendments, published on October 11, 2017 by EPA, will be included as part of this renewal. Additionally, a number of administrative changes were made including specifying 3-hour averages as 3-hour block averages.

##### **1. Control Equipment:**

Emissions from the No. 8 Recovery Furnace are controlled by an electrostatic precipitator. The recovery furnace acts as a control device for the incineration of HVLC NCG gases.

##### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 8 Recovery Furnace is subject to the following requirements:

- ADEM Admin. Code 335-3-14-.04 (9) Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) limits for particulate matter, total reduced sulfur, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds and sulfuric acid mists;
- Rule 335-3-10-.02 (1) and (28) New Source Performance Standards 40 CFR 60 - Subpart BB for Kraft pulp mills when black liquor solids are fired;



- Rule 335-3-10-.02(2)(b) New Source Performance Standards Subpart Db for nitrogen oxide emissions and 40 CFR 60 Subpart A, General Provisions when fossil fuel oil or natural gas are fired; and
- National Emission Standards for Hazardous Pollutants General Provisions as provided for in Table 1 of Subpart MM and 40 CFR Part 63 Subpart MM.

The No. 8 Recovery Furnace has the following limits and monitoring requirements:

PM	$\leq 0.025$ gr/dscf at 8% O <sub>2</sub> and $\leq 77$ lbs/hr
TRS	$\leq 5$ ppm <sub>dv</sub> at 8% O <sub>2</sub> and $\leq 9.6$ lbs/hr
NO <sub>x</sub>	$\leq 75$ ppm <sub>dv</sub> at 8% O <sub>2</sub> and $\leq 192.7$ lbs/hr Pursuant to Section 60.44b(c), Code of Federal Regulations, the fossil fuel annual capacity factor $\leq 10\%$ , where the annual capacity factor is defined as the ratio between the actual heat input to the boiler from fossil fuel during a calendar year and the potential heat input to the boiler had it been operated 8,760 hours at the maximum designed heat input
Opacity	$\leq 35 \%$
SO <sub>2</sub> (BLS fired)	$\leq 100$ ppm <sub>dv</sub> at 8% O <sub>2</sub> (3-hour block average) and $\leq 357.3$ lbs/hr
SO <sub>2</sub> (fuel oil fired)	$\leq 0.3$ lbs/MMBtu fuel oil heat and $\leq 357.3$ lbs/hr
CO	$\leq 200$ ppm <sub>dv</sub> at 8% O <sub>2</sub> and $\leq 312.6$ lbs/hr
VOC	$\leq 0.048$ lbs/MMBtu and $\leq 159.4$ lbs/hr
SAM	$\leq 5$ ppm <sub>dv</sub> and $\leq 27.4$ lbs/hr
HAPS	PM as a surrogate $\leq 0.044$ gr/dscf @ 8% O <sub>2</sub>

- Yearly emissions tests will be required for particulate matter;
- For particulate matter and opacity periodic monitoring, if the average of any ten consecutive six minute opacity averages exceeds 20% the cause is to be investigated and appropriate corrective action is to be taken;
- A continuous TRS monitor (CEMs) and continuous opacity monitor (COMs) shall be installed, maintained, and operated;
- Records of all three hour block average black liquor firing rates for this unit shall be maintained for PM, TRS, SO<sub>2</sub>, NO<sub>x</sub>, VOC, CO, and SAM periodic monitoring;
- Since this source is subject to MACT II, it is required to submit semi-annual excess emission reports and must comply with the monitoring, testing, and reporting requirements of Subpart MM;
- ARC is required to submit quarterly excess TRS and Opacity emission reports;
- ARC shall perform and submit an emission test for SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, and SAM once every five years; and
- Records of the amount of fuel oil and natural gas fired shall be made and the annual capacity factor calculated for each calendar year and maintained on file available for review for at least five years.

### **C. No. 8 Smelt Dissolving Tank:**

The No. 8 Smelt Dissolving Tank uses weak wash to dissolve the inorganic residue from the combustion of black liquor solids in the No. 8 Recovery Furnace. The dissolved smelt, which contains a mixture of sodium sulfide and sodium carbonate called “green liquor”, is then sent to the Mill’s causticizing area for further processing. The Babcock & Wilcox smelt dissolving tank was originally installed in 1991. Updates associated with the 40 CFR Part 63 Subpart MM amendments, published on October 11, 2017 by EPA, will be included as part of this renewal. Also, a number of administrative changes were made, including specifying 3-hour averages as 3-hour block averages.

### 1. Control Equipment:

The vent stack of the No. 8 Smelt Dissolving Tank is fitted with a wet dynamic fan Ducon wet scrubber. The wet scrubber is used control the entrained particulate matter and TRS.

#### a. Emission Limits and Proposed Periodic Monitoring:

The No. 8 Smelt Dissolving Tank is subject to:

- 40 CFR 60 Subpart A and Subpart BB;
- ADEM Admin. Code 335-3-14-.04 (9) Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) limits for particulate matter, total reduced sulfur, and sulfur dioxide;
- ADEM Admin. Code 335-3-4-.01 for opacity; and
- 40 CFR Part 63 Subpart MM.

The No. 8 Smelt Dissolving Tank has the following limits and monitoring requirements:

PM	$\leq 0.12$ lbs/ton of BLS (dry weight) and $\leq 16.0$ lbs/hr
TRS	$\leq 0.033$ lb/ton of BLS and $\leq 4.4$ pounds per hour
SO <sub>2</sub>	$\leq 0.05$ lbs/ton of BLS (3-hour block average) and $\leq 6.67$ lbs/hr
Opacity	$\leq 20$ % with one 6-minute period up to 40 % in any one hour period
HAPS	PM as a surrogate for HAPS $\leq 0.2$ lbs/ton of BLS

- Yearly particulate matter emissions tests are required to be performed and submitted;
- Since this source is subject to MACT II, it is required to submit semi-annual excess emission reports and must comply with the monitoring, testing, and reporting requirements of Subpart MM;
- For PM, TRS, and SO<sub>2</sub> periodic monitoring, ARC shall monitor and maintain records of all the three-hour block average liquor firing rate;
- For TRS, and SO<sub>2</sub> periodic monitoring, ARC shall monitor and maintain records of all the three-hour block average wet scrubber weak wash makeup flow rate and scrubber recirculation flow rate;
- ARC shall perform and submit a TRS and SO<sub>2</sub> emission test once every five years; and
- Pursuant to 40 CFR Part 63, Subpart MM, ARC shall monitor the wet scrubber liquid recirculation flow rate and the fan amperage.

### **VI. BACKUP NCG INCINERATOR:**

The Backup NCG Incinerator is used as a backup to the lime kilns as a control for HAP emissions from the Mill's LVHC systems. These systems are subject to 40 CFR 63 Subpart S, National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry, which establishes operational requirements for incinerators used for the purpose of HAPs control. The Backup NCG Incinerator fires natural gas and NCGs from the No. 7 and 8 Fiber Lines. The NCGs are only fired in the Backup NCG Incinerator when a lime kiln (primary HAP control device) is not operating simultaneously with the continuous digesters and/or the multiple effect evaporator systems. The Backup NCG Incinerator can burn LVHC gases from only one fiber line at any given time. The unit must meet the following requirements:

- Reduce total HAP emissions by 98 percent or more by weight; or
- Reduce the total HAP concentration at the outlet of the thermal oxidizer to 20 parts per million or less by volume, corrected to 10 percent oxygen on a dry basis; or
- Reduce total HAP emissions using a thermal oxidizer designed and operated at a minimum temperature of 871°C (1600°F) and a minimum residence time of 0.75 seconds.

The Mill has requested that this unit be limited to operate no more than 10% of the total operating time of the No. 7 and No. 8 Pulp Mills.

## **VII. RECAUSTICIZING SYSTEM:**

The Reausticizing area and No. 7 and No. 8 Lime Kilns are integral to the recovery of pulping chemicals and the conversion of the pulping chemicals back to active ingredients. This is part of the recovery loop also includes the multiple-effect evaporator system and recovery furnace. Reausticizing is the conversion of sodium carbonate in green liquor to sodium hydroxide in white liquor by a reaction with lime. The green liquor from the smelt dissolving tank is combined with reburned lime from the lime kiln. Then it is transferred to an agitated tank known as a slaker. Next, the slurry is transferred from the last causticizer to a clarifier to settle out the lime mud, and the white liquor is pumped to a white liquor storage tank for use in the digester.

### **A. No. 7 Lime Kiln:**

The clarified lime mud slurry is pumped from the mud storage tank and is then vacuum filtered to remove the sodium compounds and water. The high solids lime mud is then fed to a rotary kiln where it is dried and burned to drive off the CO<sub>2</sub> and recover the lime to be re-used in the reausticizing process. The lime kiln is currently permitted to fire natural gas, glycerin, biodiesel, tall oil, H<sub>2</sub>, and No. 2-5 fuel oils (containing less than 1.0 percent sulfur). The No. 7 Lime Kiln no longer has the capability to burn pet coke and will be removed as a permitted fuel during this renewal. The Allis Chalmers lime kiln was originally installed in 1978 and was later modified in 2005-2006. It has the capacity to produce 35,000 lb/hr CaO. Updates associated with the 40 CFR Part 63 Subpart MM amendments, published on October 11, 2017 by EPA, will be included as part of this renewal. Also, a number of administrative changes were made, including specifying 3-hour averages as 3-hour block averages.

#### **1. Control Equipment:**

The lime kiln is equipped with a venturi scrubber to control particulate, SO<sub>2</sub>, and PM HAP emissions. The lime kiln is used to control the LVHC gases at the Mill.

#### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 7 Lime Kiln is subject to:

- The requirements of ADEM Admin. Code 335-3-14-.04 (9) Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) limits for particulate matter, VOC, TRS, carbon monoxide, sulfur dioxide, sulfuric acid mist, and nitrogen oxides;
- The requirements of ADEM Admin. Code 335-3-4-.01 for opacity;
- 40 CFR Part 63 Subpart MM (MACT II) for HAPs; and
- 40 CFR Part 60 Subpart BB for TRS and PM.

The No. 7 Lime Kiln has the following limits:

PM (gas)	≤ 0.035 gr/sdcf @ 10% O <sub>2</sub> and ≤ 14.7 lbs/hr when firing natural gas
PM (oil)	≤ 0.07 gr/sdcf @ 10% O <sub>2</sub> and ≤ 26.9 lbs/hr when firing oil
SO <sub>2</sub>	≤ 50.0 ppmdv @ 10% O <sub>2</sub> (3-hour block average) and ≤ 23.3 lbs/hr
NO <sub>x</sub>	≤ 175.0 ppmdv @ 10% O <sub>2</sub> and ≤ 58.9 lbs/hr
TRS	≤ 8.0 ppmdv @ 10% O <sub>2</sub> and ≤ 2.0 lbs/hr
Opacity	≤ 20 % with one six-minute period up to 40% in any one hour period
HAPS	(PM as a surrogate) ≤ 0.064 gr/dscf @ 10 % O <sub>2</sub>
VOC	≤ 78.0 ppmdv @ 10% O <sub>2</sub> and ≤ 15.0 lbs/hr
CO	≤ 100.0 ppmdv @ 10% O <sub>2</sub> and ≤ 20.5 lbs/hr
SAM	≤ 1.2 lbs/hr

- Yearly emissions tests will be required for particulate matter, and at least once every five year, the annual test shall be performed while firing the non-predominant fuel;
- A continuous TRS monitor (CEMs) shall be installed, maintained, and operated;

- Records of all three hour block average lime mud feed rate for this unit shall be maintained for at least five years for PM, SO<sub>2</sub>, NO<sub>x</sub>, VOC, CO, and SAM periodic monitoring;
- Records of all three hour block average wet scrubber pressure drop or liquid flow rate for this unit shall be maintained for at least five years for PM and SO<sub>2</sub> periodic monitoring;
- Since this source is subject to MACT II, it is required to submit semi-annual excess emission reports and must comply with the monitoring, testing, and reporting requirements of Subpart MM;
- ARC is required to submit quarterly excess TRS emission reports; and
- ARC shall perform and submit an emission test for SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, and SAM once every five years.

**B. 180 Ton Petroleum Coke Storage and Transfer System:**

The Mill is no longer capable of burning pet coke in the No. 7 Lime Kiln. As a result, this unit will be removed from the permit at this time.

**C. No. 8 Lime Kiln:**

The No. 8 Lime Kiln is currently permitted to fire natural gas, glycerin, biodiesel, tall oil, H<sub>2</sub>, and No. 2-5 fuel oils (containing less than 1.0 percent sulfur). The Allis Chalmers lime kiln was originally installed in 1991 and was later modified in 2005. It has the capacity to produce 45,000 lb/hr CaO. Updates associated with the 40 CFR Part 63 Subpart MM amendments, published on October 11, 2017 by EPA, will be included as part of this renewal. Also, a number of administrative changes were made, including specifying 3-hour averages as 3-hour block averages.

**1. Control Equipment:**

The No. 8 Lime Kiln is equipped with an electrostatic precipitator to control particulate and PM HAP emissions. The lime kiln is used to control the LVHC gases at the Mill.

**a. Emission Limits and Proposed Periodic Monitoring:**

The No. 8 Lime Kiln is subject to:

- The requirements of ADEM Admin. Code 335-3-14-.04 (9) Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) limits for particulate matter, VOC, TRS, carbon monoxide, sulfur dioxide, sulfuric acid mist, and nitrogen oxides;
- The requirements of ADEM Admin. Code 335-3-4-.01 for opacity;
- 40 CFR Part 63 Subpart MM (MACT II) for HAPs; and
- 40 CFR Part 60 Subpart BB for TRS and PM.

The No. 8 Lime Kiln has the following limits:

PM (gas)	≤ 0.035 gr/dscf @ 10% O <sub>2</sub> and ≤ 14.6 lbs/hr
PM (oil)	≤ 0.07 gr/dscf @ 10% O <sub>2</sub> and ≤ 29.2 lbs/hr
SO <sub>2</sub>	≤ 50 ppm <sub>dv</sub> @ 10% O <sub>2</sub> (3-hour block average) and ≤ 25.3 lbs/hr
NO <sub>x</sub>	≤ 100 ppm <sub>dv</sub> @ 10% O <sub>2</sub> and ≤ 36.3 lbs/hr
TRS	≤ 8 ppm <sub>dv</sub> @ 10% O <sub>2</sub> and ≤ 2.2 lbs/hr
Opacity	≤ 20 % with one six-minute period up to 40% in any one hour period
HAPS	(PM as a surrogate) ≤ 0.064 gr/dscf @ 10 % O <sub>2</sub>
VOC	≤ 78 ppm <sub>dv</sub> @ 10% O <sub>2</sub> and ≤ 16.3 lbs/hr
CO	≤ 52 ppm <sub>dv</sub> @ 10% O <sub>2</sub> and ≤ 11.5 lbs/hr
SAM	≤ 1.3 lbs/hr

- Yearly emissions tests will be required for particulate matter, and at least once every five year, the annual test shall be performed while firing the non-predominant fuel;

- For particulate matter and opacity periodic monitoring, if the average of any ten consecutive six minute opacity averages exceeds 15% the cause is to be investigated and appropriate corrective action is to be taken;
- A continuous TRS monitor (CEMs) and continuous opacity monitor (COMs) shall be installed, maintained, and operated;
- Records of all three hour block average lime mud feed rate for this unit shall be maintained for at least five years for PM, SO<sub>2</sub>, NO<sub>x</sub>, VOC, CO, and SAM periodic monitoring;
- Since this source is subject to MACT II, it is required to submit semi-annual excess emission reports and must comply with the monitoring, testing, and reporting requirements of Subpart MM;
- ARC is required to submit quarterly excess TRS and Opacity emission reports; and
- ARC shall perform and submit an emission test for SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, and SAM once every five years.

## **VIII. UTILITIES:**

ARC's utility area consists of the No. 7 and No. 8 Power Boilers, to generate steam and electricity to support the Mill's operations.

### **A. No. 7 Power Boiler**

The No. 7 Power Boiler is a 504 lb/MMBTU boiler that generates steam and is permitted to burn natural gas, biodiesel, tall oil, fuel oils 2-5, glycerin, and wood waste (wood residue from woodyard). The boiler was originally installed in 1978. Air Permit X002 was issued on February 13, 2014, authorizing the use of natural gas as a primary fuel, as opposed to only used in the igniter burners as it once was. The issuance of this permit incorporated new NO<sub>x</sub> limits while firing natural gas only, and natural gas with other fossil fuels, as required by NSPS Subpart D. The Mill no longer fires wastewater treatment plant (WWTP) residuals in the No. 7 Power Boiler. As a result, WWTP residuals will be removed as a permitted fuel, and references to NESHAP Subpart E will be removed during this renewal. The power boilers at ARC are equipped with an oxygen trim system, as defined in 40 CFR 63.7575. Recordkeeping and Reporting Proviso #6 will be removed during this renewal as the 30-day rolling average oxygen content requirement does not apply to boilers that have an oxygen trim system installed. Also, a number of administrative changes were made at this time.

#### **1. Control Equipment:**

Flue gas from this boiler is controlled by a dust collection chamber and venturi wet scrubber. The scrubber helps to control PM emissions from the firing of different fuels and combos of those fuels. An atomized steam injection system is also utilized to ensure the boiler meets the NO<sub>x</sub> limit while firing solely natural gas.

##### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 7 Power Boiler is subject to:

- The requirements of New Source Performance Standards 40 CFR 60 - Subpart D for nitrogen oxide, particulate matter, opacity, and sulfur dioxide emissions;
- The requirements of ADEM Admin. Code 335-3-14-.04 (9)(b) for sulfur dioxide;
- The requirements of ADEM Admin. Code 335-3-4-. 01 for opacity; and
- 40 CFR Part 63, Subpart DDDDD – Boiler MACT, as an existing source, hybrid suspension grate biomass boiler.

The No. 7 Power Boiler has the following limits:

PM	≤ 0.10 lbs/MMBtu heat input
Filterable PM	≤ 0.44 lb/MMBtu (0.55 lb/MMBtu of steam output)

CO	$\leq 3,500$ ppm by volume on a dry basis corrected to 3% oxygen, or 3.5 lb/MMBtu of steam output, on a 3-run average
SO <sub>2</sub>	The fuel oil sulfur content $\leq 0.25$ % by weight
SO <sub>2</sub>	$\leq 0.80$ lbs/MMBtu heat input
NO <sub>x</sub>	$\leq 0.30$ lbs/MMBtu heat input (wood waste or wood waste and fossil fuel); $\leq 0.20$ lbs/MMBtu heat input (Nat. gas only)
Opacity	$\leq 20$ % with one 6-minute period up to 40 % in any one hour period
Hg	$\leq 5.7E-06$ lb/MMBtu (6.4E-06 lb/MMBtu of steam output)
HCl	$\leq 0.022$ lb/MMBtu (0.025 lb/MMBtu of steam output)

- Yearly emissions tests will be required for particulate matter;
- Records of all three hour block average steam production rate for this unit shall be maintained for at least five years for PM, SO<sub>2</sub>, and NO<sub>x</sub> periodic monitoring;
- Records of all three hour block average wet scrubber pressure drop or liquid flow rate for this unit shall be maintained for at least five years for PM periodic monitoring;
- For SO<sub>2</sub> periodic monitoring obtain receipts from the fuel oil supplier that certify sulfur content in fuel for the calendar year and maintain vendor oil specification on file for at least five years;
- ARC shall perform and submit an emission test for SO<sub>2</sub> and NO<sub>x</sub> at least once every five years;
- The Boiler MACT requires the installation of an oxygen trim system in order to ensure compliance with carbon monoxide limits. The oxygen content would be required to be set no lower than the lowest hourly average oxygen level measured during the most recent carbon monoxide performance test;
- Annual testing of mercury, hydrogen chloride, and carbon monoxide will be required unless two consecutive performance tests demonstrate that the controlled emissions are less than 75 percent of the respective emission limits, in which case testing will be required every three years with no more than 37 months between tests (Boiler MACT); and
- The Boiler MACT requires a one-time energy assessment, 5-year tune-ups, and new startup and shutdown procedures. All of these requirements are found in Table 3 of the Subpart.

### **B. No. 8 Power Boiler**

The No. 8 Power Boiler is a 266 MMBtu/hr boiler that generates steam and is permitted to burn natural gas, biodiesel, tall oil, fuel oils 2-5, glycerin, and wood waste. The boiler was originally installed in 1991. Air Permit X017 was issued on June 24, 2013 authorizing the use of natural gas as a primary fuel, as opposed to only used in the igniter burners as it once was. The Mill no longer fires wastewater treatment plant (WWTP) residuals in the No. 8 Power Boiler. As a result, WWTP residuals will be removed as a permitted fuel, and references to NESHAP Subpart E will be removed during this renewal. The power boilers at ARC are equipped with an oxygen trim system, as defined in 40 CFR 63.7575. Recordkeeping and Reporting Proviso #6 will be removed during this renewal as the 30-day rolling average oxygen content requirement does not apply to boilers that have an oxygen trim system installed. Also, a number of administrative changes were made at this time.

#### **1. Control Equipment:**

Flue gas quality from this boiler is controlled by an electrostatic precipitator. The ESP helps to control PM emissions. An induced flue gas recirculation (IFGR) system is also utilized to ensure the boiler meets the NO<sub>x</sub> limit while firing solely natural gas.

#### **a. Emission Limits and Proposed Periodic Monitoring:**

The No. 8 Power Boiler is subject to:

- ADEM Admin. Code 335-3-14-.04 (9) Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) limits for particulate matter, opacity, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds and sulfuric acid mists;
- New Source Performance Standards 40 CFR 60 - Subpart Db for nitrogen oxide, particulate matter, opacity, and sulfur dioxide emissions; and
- 40 CFR Part 63, Subpart DDDDD – Boiler MACT, as an existing source, hybrid suspension grate biomass boiler.

The No. 8 Power Boiler has the following limits:

PM	$\leq 0.10$ lbs/MMBtu heat input and $\leq 26.6$ lbs/hr
Filterable PM	$\leq 0.44$ lb/MMBtu (0.55 lb/MMBtu of steam output)
SO <sub>2</sub>	$\leq 0.3$ lbs/MMBtu heat input and $\leq 79.8$ lbs/hr
NO <sub>x</sub>	$\leq 0.25$ lbs/MMBtu heat input when wood waste or wood waste and fossil fuel (natural gas or fuel oil) are fired. $\leq 0.10$ lbs/MMBtu heat input when natural gas or fuel oil (no wood waste) are fired. Pursuant to Section 60.44b(c), Code of Federal Regulations, the fossil fuel annual capacity factor $\leq 10\%$ , where the annual capacity factor is defined as the ratio between the actual heat input to the boiler from fossil fuel during a calendar year and the potential heat input to the boiler had it been operated 8,760 hours at the maximum designed heat input.
SAM	$\leq 4$ lbs/hr
CO	$\leq 0.3$ lbs/MMBtu heat input
CO	$\leq 3,500$ ppm by volume on a dry basis corrected to 3% oxygen, or 3.5 lb/MMBtu of steam output, on a 3-runaverage
Opacity	$\leq 20\%$ except for one six-minute period per hour of not more 27%
VOC	$\leq 0.03$ lbs/MMBtu heat input
Hg	$\leq 5.7E-06$ lb/MMBtu (6.4E-06 lb/MMBtu of steam output)
HCl	$\leq 0.022$ lb/MMBtu (0.025 lb/MMBtu of steam output)
Opacity	$\leq 10\%$ opacity (daily block average)

- Yearly emissions tests will be required for particulate matter;
- Records of all three hour block average steam production rate for this unit shall be maintained for at least five years for PM, CO, VOC, SAM, SO<sub>2</sub>, and NO<sub>x</sub> periodic monitoring;
- For particulate matter and opacity periodic monitoring, if the average of any ten consecutive six minute opacity averages exceeds 15% the cause is to be investigated and appropriate corrective action is to be taken;
- A continuous opacity monitor (COMs) shall be installed, maintained, and operated;
- Records of the amount of fuel oil and natural gas fired shall be made and the annual capacity factor calculated for each calendar year and maintained on file available for review for at least five years;
- For SO<sub>2</sub> periodic monitoring obtain receipts from the fuel oil supplier that certify sulfur content in fuel for the calendar year and maintain vendor oil specification on file for at least five years;
- ARC is required to submit quarterly excess Opacity emission reports;

- ARC shall perform and submit an emission test for SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, and SAM at least once every five years;
- The Boiler MACT requires the installation of an oxygen trim system in order to ensure compliance with carbon monoxide limits. The oxygen content would be required to be set no lower than the lowest hourly average oxygen level measured during the most recent carbon monoxide performance test;
- Annual testing of mercury, hydrogen chloride, and carbon monoxide will be required unless two consecutive performance tests demonstrate that the controlled emissions are less than 75 percent of the respective emission limits, in which case testing will be required every three years with no more than 37 months between tests (Boiler MACT); and
- The Boiler MACT requires a one-time energy assessment, 5-year tune-ups, and new startup and shutdown procedures. All of these requirements are found in Table 3 of the Subpart.

## **IX. CHEMICAL PLANT:**

Since chlorine dioxide is an extremely unstable compound at room temperature and pressure and cannot be easily stored, ARC produces it on-site. ClO<sub>2</sub> is generated as a gas from the reaction of sodium chlorate with sulfuric acid which uses methanol as a catalyst. The gas is absorbed in chilled water. The ClO<sub>2</sub> generating system consists of a generator/crystallizer, reboiler, indirect heat exchanger, generator dump tank, chlorine dioxide absorption tower, scrubber tower, salt cake filter, and vacuum system. The sodium chlorate, sodium chloride, sulfuric acid, and methanol are combined in the generator/crystallizer which produces gaseous chlorine dioxide, a precipitate of salt cake and a trace amount of chlorine gas. The vacuum system pulls the vapors from the generator and into the collection system.

### **A. Chlorine Dioxide Plant**

The Mill operates an Eka Nobel chlorine dioxide plant. The plant was installed in 1990, and later modified in 1999. This unit has the capacity to produce 9,583 pounds per hour. On May 29, 2013, Air Permit X024 was issued for the construction of a new absorption column and scrubber as well as new stacks for the new and existing absorption column and scrubbers. As part of the third renewal, the Mill will be required to monitor the white liquor scrubber recirculation flow rate and the pH of the scrubbing solution instead of the process scrubber chilled water flow and temperature. Operating limits for the recirculation flow rate and pH will be required to be set during compliance testing. The monitoring parameters were updated due to the white liquor scrubber being the final control device before venting to the atmosphere.

#### **1. Control Equipment:**

Gases from the generator are cooled in a heat exchanger. The condensate and gases flow to an absorption tower where chilled water is used to absorb the ClO<sub>2</sub>. The gases that are not absorbed pass through to a barometric condenser, and into the tail gas scrubber. The scrubber also collects the vent gases from the chlorine dioxide storage tanks. The scrubber uses chilled water as its scrubbing medium. The following units vent to the tail gas scrubber: the ClO<sub>2</sub> absorption tower, the salt cakes filter, and the north and south ClO<sub>2</sub> solution storage tanks. After the tail gas scrubber, the gases are treated in a white liquor scrubber before venting to the atmosphere.

#### **a. Emission Limits and Proposed Periodic Monitoring**

The ClO<sub>2</sub> generator is not subject to any federal standards, but there are State air-toxic ClO<sub>2</sub> and Cl emission limits of 0.55 lb/hr and 2.4 lb/hr, respectfully. The daily monitoring for this unit is to measure and record the white liquor scrubber recirculation flow rate and pH. The Mill must also perform emissions testing at least once per 5 year permitting period.

## **X. RICE UNITS:**

ARC operates eight (8) stationary Reciprocating Internal Combustion Engines (RICE) units that provide emergency power or water to different areas of the Mill. As part of the third renewal, Air Permit X815, issued on January 10, 2020 for the No. 2 Mill Service Pump will be included in the Title V. The First Aid



Emergency Generator is no longer operational and will be removed from the permit. Additionally, numerous administrative changes were made to the RICE Unit section, including renaming the No. 2 Mill Service Pump to the No. 1 Diesel Fire Pump and the No. 1 Mill Service Pump to the No. 2 Diesel Fire pump. The RICE units are identified and described by the following:

- X853 – Admin Building Emergency Generator; 1991; 299 Hp
- X815 – No. 1 Diesel Fire Pump; 2019; 220 Hp
- X814 – No. 2 Diesel Fire Pump; 1991; 268.2 Hp
- X125 – No. 7 Lime Kiln Auxiliary Drive Engine; 1978; 55 Hp
- X434 – No. 8 Lime Kiln Auxiliary Drive Engine; 2015; 73.4 Hp
- X126 – No. 7 Turbine Emergency Generator; 2012; 335.25 Hp
- X327 – No. 8 Turbine Emergency Generator; 2012; 335.25 Hp

All of these units are diesel powered, emergency-use units, and based on the year, size, and purpose, are subject to the following regulations:

- Units X853, X814, and X125 are subject to the applicable requirements of ADEM Admin. Code R. 335-3-11-.06 (103), “National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Hazardous Air Pollutant (HAP) Emissions from Stationary Reciprocating Internal Combustion Engines” (40 CFR Part 63 Subpart ZZZZ).
- Units X434, X126, X327, and X815 are subject to the applicable requirements of ADEM Admin. Code R. 335-3-10-.02 (87), “Standards of Performance for Stationary Compression Ignition Internal Combustion Engines” (40 CFR Part 60 Subpart IIII).

NESHAP ZZZZ and NSPS IIII require these units to adhere to the following standards:

Emission Point #	Pollutant	Emission Limit
X853, X814, X125	Opacity	Shall not exceed 20% based on 6-minute average, except one 6-minute period in every 60-minute period it shall not exceed 40%;
X434, X126, X327, X815	Opacity	Shall not discharge greater than 20% opacity during acceleration mode, greater than 15% opacity during lugging mode, and 50% opacity during the peaks.
X434	NMHC and nitrogen oxides (NO <sub>x</sub> )	4.7 g/kW-hr (3.51 g/hp-hr)
X434	CO	5.0 g/kW-hr (3.73 g/hp-hr)
X434	PM	0.4 g/kW-hr (0.30 g/hp-hr)
X126, and X327	NMHC and nitrogen oxides (NO <sub>x</sub> )	4.0 g/kW-hr (2.98 g/hp-hr)
X126, and X327	CO	3.5 g/kW-hr (2.61 g/hp-hr)
X126, and X327	PM	0.20 g/kW-hr (0.15 g/hp-hr)
X815	NMHC and nitrogen oxides (NO <sub>x</sub> )	4.0 g/kW-hr (3.0 g/hp-hr)
X815	PM	0.20 g/kW-hr (0.15 g/hp-hr)

- All of these units are limited to less than 100 hours per year of non-emergency use, per the requirements of NESHAP ZZZZ and NSPS IIII, records of which must be kept in a suitable form for inspection for at least 5 years.

#### **XI. CAM:**

CAM applies to pollutant specific emission units that are subject to an emission limitation or standard where a control device is used to achieve compliance with an applicable emission limitation. The CAM rule requires facilities to monitor compliance indicators for emission units to provide reasonable assurance for compliance with regulatory emission limitations. The following units are subject to the CAM rule: Nos. 7 and 8 Power Boiler, No. 7 Lime Kiln. The other units fall under one of the several exemptions as defined by 40 CFR 64.2(b).

These are the exemptions that apply to one or more emission units operated by the Mill:

- The requirements of Part 64 shall not apply to emission limitations or standards proposed by EPA after November 15, 1990, pursuant to section 111 or 112 of the Clean Air Act (40 CFR 64.2(b)(1)(i));
- The requirements of Part 64 shall not apply to emission limitations or standards for those unit that do not uses a control device to achieve compliance with any such emission limitation or standard;
- The requirements of Part 64 shall not apply to emission limitations or standards for those units where the pre-controlled emissions of specific pollutants would not classify unit as a major source; and
- The requirements of Part 64 shall not apply to emission limitations or standards for which a Part 70 or 71 permit specifies a continuous compliance determination method (40 CFR 64.2(b)(1)(vi)).

For some of the units that are subject to CAM: No. 7 & 8 Power Boilers (PM emissions), and the No. 7 Lime Kiln (SO<sub>2</sub> emissions), the Title V Permit currently requires continuous monitoring, which satisfies the CAM rule that requires facilities to monitor compliance indicators for emission units to provide reasonable assurance for compliance with regulatory emission limitations.

- No. 7 Power Boiler (PM) – continuous monitoring of recirculation flow and scrubber pressure drop;
- No. 8 Power Boiler (PM) – continuous monitoring of PM correlates with COMs
- No. 7 Lime Kiln (SO<sub>2</sub>) – continuous monitoring of lime mud feed rate, wet scrubber pressure drop or liquid flow rate

For the NO<sub>x</sub> emissions from both the No. 7 and No. 8 Power Boilers, CAM remains applicable with no exemptions. Each unit is subject to CAM for NO<sub>x</sub> emissions while firing only Natural Gas. The No. 7 Power Boiler utilizes an atomized steam injection system for the control of NO<sub>x</sub> emissions, while the No. 8 Power Boiler uses an induced flue gas recirculation (IFGR) system to control NO<sub>x</sub> emissions. The Mill does not operate the No. 8 Power Boiler damper in “automatic” status and requested this option to be removed from the CAM Plan during this renewal. ARC will use the Flue Gas Recirculation Ratio to ensure NO<sub>x</sub> compliance on the No. 8 Power Boiler. The CAM Plan for these units are listed below:

#### **CAM Plan for No. 7 Power Boiler – Unit Z008 – NO<sub>x</sub> emissions**

	Indicator 1	Indicator 2
I. Indicator	Atomized Steam Pressure while burning natural gas only	N/A
Measurement Approach	Continuously monitor atomized steam pressure	N/A
II. Indicator Range	Minimum 3-hour block average, as established during a compliance performance test	N/A
III. Performance Criteria		

<b>1. Representative Data</b>	3-hour block average atomized steam pressure	N/A
<b>2. Verification of Operation Status</b>	Install and operate monitoring device in accordance with manufacturer's recommendation	N/A
<b>3. QA/QC Practices and Criteria</b>	Calibration of the meter will be performed at least annually in accordance with the manufacturer's recommendation	N/A
<b>4. Monitoring Frequency</b>	A minimum of once every 15 minutes, and reduced to a 3-hour block average	N/A
<b>5. Data collection Procedures</b>	Atomized steam pressure recorded at a minimum of once every 15 minutes using the facility's PI system, and reduced to a 3-hour block average	N/A
<b>6. Averaging Period</b>	3-hour block average basis	N/A

**CAM Plan for No. 8 Power Boiler – Unit X017 – NO<sub>x</sub> emissions**

	Indicator 1
I. Indicator	Flue Gas Recirculation Ratio while burning natural gas only
Measurement Approach	Flue Gas Recirculation flow ratio must match or exceed most recent compliance FGR flow ratio
II. Indicator Range	Minimum 3-hour block average, as established during a compliance performance test
III. Performance Criteria	
<b>1. Representative Data</b>	3-hour block average FGR flow ratio
<b>2. Verification of Operation Status</b>	Install and operate monitoring device in accordance with manufacturer's recommendation
<b>3. QA/QC Practices and Criteria</b>	At least annually, confirm the recirculation flow meter reads zero when unit is not operating
<b>4. Monitoring Frequency</b>	A minimum of once every 15 minutes, and reduced to a 3-hour block average
<b>5. Data collection Procedures</b>	Flue Gas Recirculation ratio recorded at a minimum of once every 15 minutes using the facility's PI system, and reduced to a 3-hour block average
<b>6. Averaging Period</b>	3-hour block average basis



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Steven Bissey  
Industrial Chemicals Section  
Chemical Branch  
Air Division  
Alabama Dept. of Environmental Management

January 26, 2021  
Date

File ID: 660 106-0010 099 01-26-2021 T5SOB SPB 3RD RENEWAL